

## EPA Questions and Answers on e-Cycling Topics

### Question

Does dumping old TVs pose as much toxic waste as dumping old computers? What about other electronic devices, such as cell phones?

### Answer

EPA is not aware of any significant difference between color TVs and color computer monitors with respect to the amount of lead; both are generally classified as hazardous waste when disposed, unless they come from households or smaller generators. Recent research conducted at the University of Florida indicates that some other electronic devices such as cell phones and other portable devices may also test hazardous for lead using the Toxicity Characteristic Leaching Procedure (TCLP), depending on the brand and the age of the model. Lead is present in the circuit board in these products.

Based on studies that EPA and others have done to date, there is no reason to believe that U.S. landfills for municipal and industrial waste are unsafe for the disposal of discarded electronics that are not directed to the more environmentally-preferable options of reuse and recycling. While many electronics contain lead and other substances of concern, it does not appear that these substances leach from landfills and contaminate drinking water supplies. With this said, disposal of electronics should be minimized to enable reuse and recycling for resource conservation reasons.

### Question

Can color TVs and computer monitors from businesses be considered hazardous wastes when sent for disposal, and how should consumers dispose of old TVs?

### Answer

**Businesses:** Color television and computer monitors contain lead in their cathode ray tubes (CRTs), which may make the monitors characteristic hazardous wastes. The average concentration of lead in leachate from colored CRT glass generated through the toxicity characteristic leaching procedure is (TCLP) 22.2 milligrams per liter (mg/l), which is considerably more than the toxicity characteristic (TC) regulatory level of 5 mg/l used to classify a waste as hazardous for lead (Section 261.24). Other hazardous constituents sometimes present in CRT glass are mercury, cadmium, and arsenic. However, these constituents are found in very low concentrations unlikely to exceed TC limits (67 FR 40508, 405910; June 12, 2002).

### Question

Are CRTs considered hazardous waste? How should they be managed? Do they have to be recycled or can they be disposed?

### Answer

Most cathode ray tubes (CRTs) from computers and color televisions are considered hazardous waste under federal regulations when disposed (unless they come from households). They are classified this way because of the presence of lead.

CRTs sent for recycling, however, are not considered wastes as long as certain conditions are met. Used intact CRTs stored by collectors or recyclers are subject only to speculative accumulation requirements (i.e., 75% must be recycled within a year). Used broken CRTs sent for recycling within the United States must be stored in a building or packaged and labeled, and they must be packaged and labeled during transport. They must also comply with speculative accumulation limits. In addition,

CRT glass processors may not use temperatures high enough to volatilize lead.

Besides the above-mentioned requirements, exporters of CRTs for recycling must also file a notice with EPA and obtain consent from the receiving country before shipping the CRTs. However, exporters of fully processed CRT glass to glass manufacturers or lead smelters are not subject to the notice and consent requirements.

CRTs are not required to be recycled. However, if they are disposed, they must comply with full hazardous waste management requirements. For more information, see <http://www.epa.gov/osw/hazard/recycling/electron/index.htm>.

References: 40 CFR 261.4(a)(22) ([71 FR 42928, July 28, 2006](#)).

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## Regulations/Standards

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### Legislative Recycling Mandates

**Federal Legislative Mandates for Electronics Recovery:** At present, there is no Federal mandate to recycle e-waste. There have been numerous attempts to develop a Federal law. However, to date, there is no consensus on a Federal approach.

**State Mandatory Electronics Recovery Programs:** Many states have instituted mandatory electronics recovery programs. The following Web sites provide regularly updated information on state e-waste legislation:

[National Electronics Recycling Infrastructure Clearinghouse](#) [EXIT Disclaimer](#)

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## Regulations Governing Management of Used Electronics

Some electronics (such as color CRTs computer monitors, color CRT TV tubes, and smaller items such as cell phones and other “hand-helds”) test “hazardous” under Federal law. If so, they are subject to special handling requirements under Federal law, subject to certain exemptions.

EPA encourages reuse and recycling of used electronics, including those that test “hazardous.” To facilitate more reuse and recycling of these products, EPA has less stringent management requirements for products bound for reuse and recycling. Specifics follow:

**Resale or Donation:** Computer monitors and televisions sent for continued use (i.e., resale or donation) are not considered hazardous wastes.

**Federal Regulatory Requirements for Recycling of CRTs:** EPA encourages recycling of CRTs. Thus, CRTs sent for recycling are subject to streamlined handling requirements. For more information on the CRT Rule, including [export requirements](#) and [frequent questions](#) please see [Cathode Ray Tubes Final Rule](#).

**Federal Regulatory Requirements for Circuit Boards within the United States:** Circuit Boards are subject to a special exemption from Federal hazardous waste rules.

**Whole unused circuit boards** are considered unused commercial chemical products, which are unregulated.

**Whole used circuit boards** meet the definition of spent materials but also meet the definition of scrap metal. Therefore, whole used circuit boards that are recycled are exempt from the hazardous waste regulations.

**Shredded circuit boards** are excluded from the definition of solid waste if they are containerized (i.e., fiberpaks) prior to recovery. These shredded circuit boards cannot contain mercury switches, mercury relays, nickel cadmium batteries, or lithium batteries. If these materials are not treated this way, then they are considered hazardous waste and must be treated as such.

**Note:** This discussion summarizes relevant federal regulatory requirements. For the complete federal hazardous waste requirements for generators, consult [40 CFR Parts 260-262](#).



## **Federal Regulatory Requirements for Disposal CRTs and Other Electronics that Test “Hazardous”**

**Large Quantities Sent for Disposal:** Wastes from facilities that generate over 100 kilograms (about 220 lb.) per month of hazardous waste are regulated under Federal law when disposed. CRTs from such facilities sent for disposal (as opposed to reuse, refurbishment or recycling) must be manifested and sent as “hazardous waste” to a permitted hazardous waste landfill.

**Small Quantities Exempt:** Businesses and other organizations that send for disposal (as opposed to reuse, refurbishment or recycling) less than 100 kilograms (about 220 pounds) per month of hazardous waste are not required to handle this material as hazardous waste. If a “small quantity generator” wishes to dispose of a small quantity of CRTs or other used electronics that test hazardous under Federal law, these materials can go to any disposal facility authorized to receive solid waste (e.g., a municipal landfill), unless state law requires more stringent management (e.g., CA).

**Household Exemption for Electronics Sent to Disposal:** Used computer monitors or televisions generated by households are not considered hazardous waste and are not regulated under Federal regulations. State laws may be more stringent as regards electronics from households (e.g., CA).

## **State Regulatory Requirements for Disposal of Electronics that Test “Hazardous”**

State regulatory requirements for e-waste can be more stringent than the Federal requirements, and vary from state to state. California considers CRTs to be spent materials and regulates all CRT as hazardous waste, i.e. they are banned from landfills. Other states, such as Massachusetts and Florida, have taken steps to streamline hazardous waste regulations for CRTs, reducing special handling requirements if these products are directed to recycling. Many states are developing Universal Waste exemptions for CRT which also streamline management of CRTs bound for recycling. If you are planning on disposing used CRTs (or other electronics that test “hazardous” under state or Federal law), check relevant state requirements, which might be different from [federal regulatory requirements](#).

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## **Presentations**

[EPA's Regulatory Program for "E-Waste" \(PDF\)](#) (19 pp, 126K, [about PDF](#))  
[Export of Used & Scrap Electronics: What You Need to Know \(PDF\)](#) (28 pp, 177K, [about PDF](#))

<http://www.epa.gov/osw/conserva/materials/ecycling/rules.htm> is the primary source of the information above.

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